
QPC239 Recorded Telephone Dictation Trunk Card with DCK feature

Introduction

The QPC239 Recorded Telephone Dictation Trunk (RTDT) Card with DCK feature is a peripheral equipment (PE) device that can be installed in any peripheral shelf or NT8D13 Peripheral Equipment (PE) Module. The recorded telephone dictation trunk card interfaces two telephone dictation trunk lines to a Meridian 1 switch. Each trunk is independently configurable using the Trunk Administration program (LD 14).

The QPC239 RTDT Card has the following characteristics:

- two units per card
- 600 ohms (balanced) tip and ring impedance
- transmission or no transmission during dialing, selected with option switch settings
- out-of-service control lead
- direct interfacing to recording machine (DCK feature)
- switchable 4-dB pad allows control of gain between line-to-trunk and trunk-to-trunk connections (switching is done under software control)

The out-of-service (OS) control lead serves both “busy” and “out-of-service” functions. It makes the trunk appear busy to the CPU when the recording machine indicates “out of service,” and on disconnect it keeps the trunk busy until the idle signal is received from the recording machine.

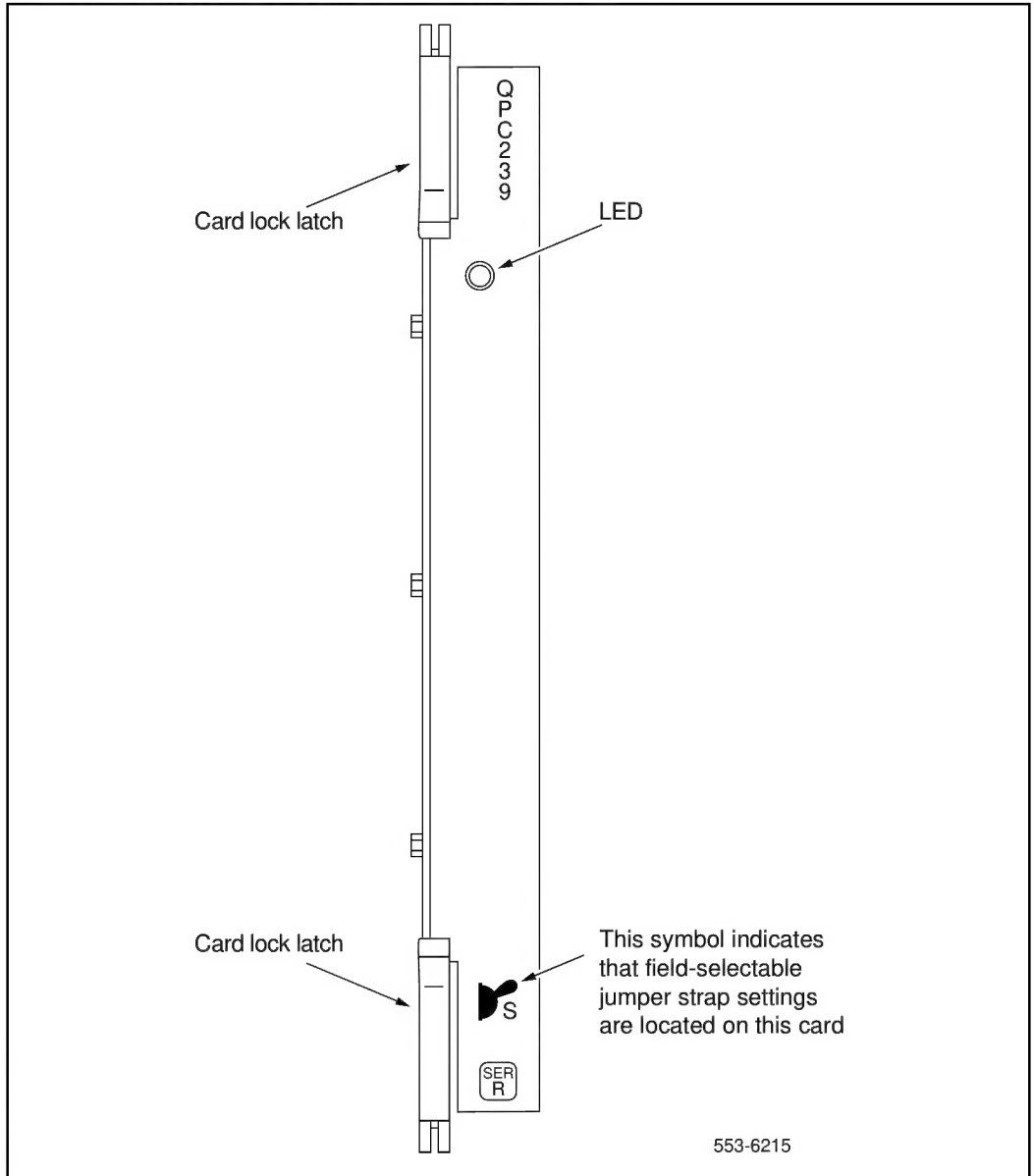
Physical description

The recorded telephone dictation trunk card mounts in any PE slot. The two trunk circuits and common multiplexing circuitry are mounted on a 31.74 cm by 25.4 cm (12.5 in. by 10 in.) printed circuit board.

The recorded telephone dictation trunk card connects to the backplane through an 80-pin connector shroud. The backplane is then cabled to the input/output (I/O) panel, which is cabled to the main distribution frame (MDF) by 25-pin cables. The telephone dictation equipment connects to the card at the MDF. See *Meridian 1 system installation procedures* (553-3001-210) for termination and cross connect information.

The faceplate of the card is equipped with a red light emitting diode (LED) (see [Figure 84](#)). This LED should only be lit if there is a problem with the card. If the LED operates in any other manner, such as continually flashing or remaining weakly lit, the card should be replaced.

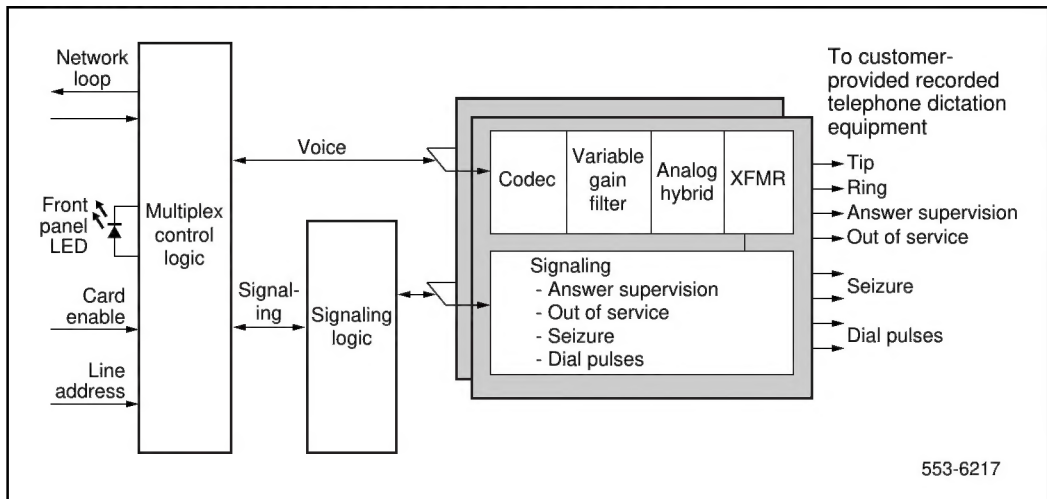
Figure 84
Recorded telephone dictation trunk card—faceplate



Functional description

Figure 85 shows a block diagram of the major functions contained on the recorded telephone dictation trunk card. Each of these functions is described on the following pages.

Figure 85
Recorded telephone dictation trunk card—block diagram



Card interfaces

The recorded telephone dictation trunk card passes both voice and signaling data over the network loop. Network loops are discussed in detail “Peripheral equipment” on page 22.

Trunk interface units

Two recorded telephone dictation trunk units are located on each QPC239 card. Each of these units interfaces directly to a customer-provided recording machine. Each trunk interface has these features:

- termination of the loop tip and ring conductors with a balanced 600-ohm terminating impedance when active or idle
- termination of an out-of-service control lead:
 - to make the trunk appear busy to the CPU when the recording machine indicates out of service
 - on disconnect to keep the trunk busy until the idle information is received from the recording machine
- an option switch to allow or disallow transmission during dialing
- the ability to connect to most recording machines without extra interfacing
- a switchable 4-dB pad for controlling gain between line-to-trunk and trunk-to-trunk connections

The recorded telephone dictation trunk card connects to a recording machine through eight leads. These connections are shown in [Table 53](#).

The out-of-service (OS) control lead serves both “busy” and “out-of-service” functions. It makes the trunk appear busy to the CPU when the recording machine indicates “out of service,” and on disconnect it keeps the trunk busy until the idle signal is received from the recording machine.

Table 53
Connections to recording machines

Lead	Function
Tip and ring	voice connection
OS	lack of ground detection from recording machine on this lead is interpreted as being out of service or busy
CS	a ground returned from the recording machine is interpreted as answer supervision (but CPU takes no action)
CS1 and CS2	seizure relay contact; closed when the card is accessed
CDP1 and CDP2	outpulse relay contacts; send dial pulses to the recording machine
Note: A ground is required from the cross connect field for the recording machine.	

Multiplex control

The multiplex control logic is common to both channels. This logic interfaces the individual trunk circuits to the peripheral bus signaling channel. Circuits are provided in the multiplex control logic to retime the digital signals received from the peripheral bus. Other circuits decode the address information contained on the peripheral bus to enable the individual trunk circuits during their selected timeslots. Logic is also provided to enable or disable the front panel LED to indicate the service state of the card. The multiplex control logic is discussed in detail in “Peripheral equipment” on page 22.

Operation

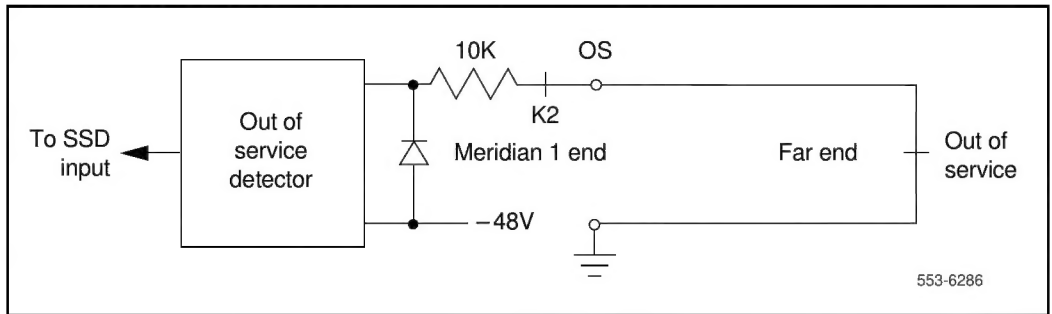
Trunk idle

Since the OS lead ([Figure 86](#)) is connected to ground, the state of the out-of-service detector is high to the Out of Service detector. Trunk cards are scanned periodically by the CE. When the card receives a card enable in timeslot 0, the signaling logic responds with a signal on the data input bus.

Trunk busy

An out-of-service condition is initiated when the recording machine removes the ground from the OS lead. When the ground is removed from the out-of-service detector, the appropriate Out of Service detector input is changed from high to low. The Out of Service detector responds with a different signal on the data input bus when scanned.

Figure 86
Out-of-service lead circuit

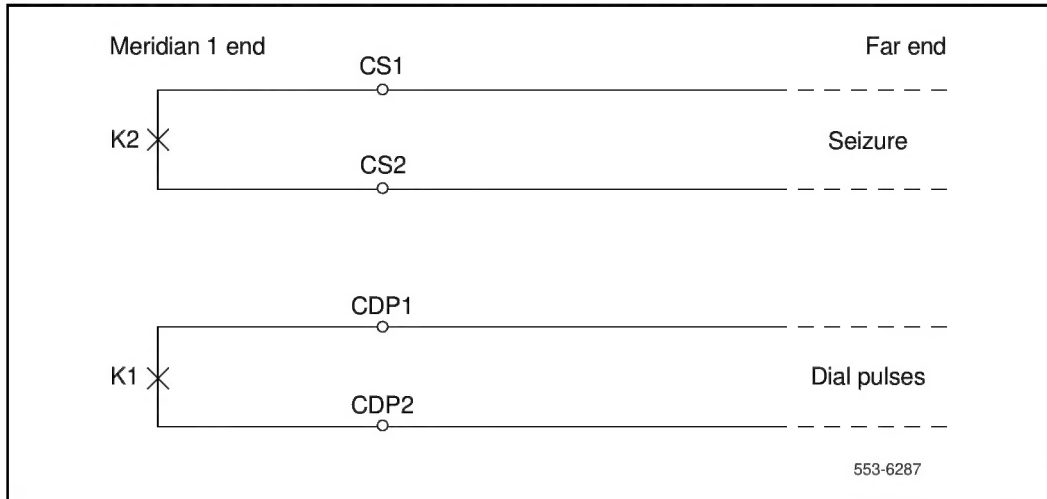


Trunk seizure

When the dial access code is dialed and the card is idle, a message is sent to the signaling logic of the card, causing the K1 relay to operate. The operation of K1 closes the dial-pulsing contact (CDP1, CDP2) and operates the K2 relay to close the seizure contact (CS1, CS2) ([Figure 87](#)).

The signaling logic responds to the enable with a signal on the data input bus. The scan stops and the card receives further enables. The signaling logic also receives signals on the data output bus and, on receipt of these, outputs the contents of the input register onto the data input bus, thus reporting the change of state. The scan cycle then continues.

Figure 87
K1 and K2 relay operation



Outpulsing

A tone and digit switch is assigned to the card throughout the seizure-to-disconnect sequence.

With Digitone class of service, 8-bit PCM word digital signals from the tone and digit switch are applied by means of the data output bus in a selected timeslot to the codec, which decodes and transmits the appropriate tone signals.

With dial pulse class of service, when ready for outpulsing, a trunk outpulsing enable is sent in an assigned timeslot (other than 0 or 1), and a message is sent to the signaling logic to set up the trunk logic so K1 is controlled by the signal level of the data output bus in the assigned timeslot.

The CE then causes K1 to outpulse the required digits by sending the appropriate data from the tone and digit switch in the selected timeslot. The RC network of resistor R47 and capacitor C15 prevents K2 from releasing during the outpulsing of digits by K1 ([Figure 88](#)).

No transmission is obtained during outpulsing by placing switch SW1 in the “on” position. During outpulsing, K3 operates, placing a 620-ohm resistor across the recording machine and disconnecting transformer T1 from leads CT and CR ([Figure 89](#)).

At the completion of outpulsing, another message is sent to the signaling logic. This message returns control of K1 to the signaling logic and the enable in the assigned timeslot is removed.

Note 1: Line cards for 2500 telephones and incoming trunks with Digitone class of service are denied access to RTDT with dial pulse class of service; however, they are allowed if RTDT has Digitone class of service. After the Digitone receiver assigned to the line card times out, the TDS is also freed. The recording machine is controlled through the assigned voice path timeslots.

Note 2: Some recording machines provide answer supervision ([Figure 90](#)). The trunk provides an answer supervision detector, but no action is taken by the system CPU.

Figure 88
Seizure and dial pulsing

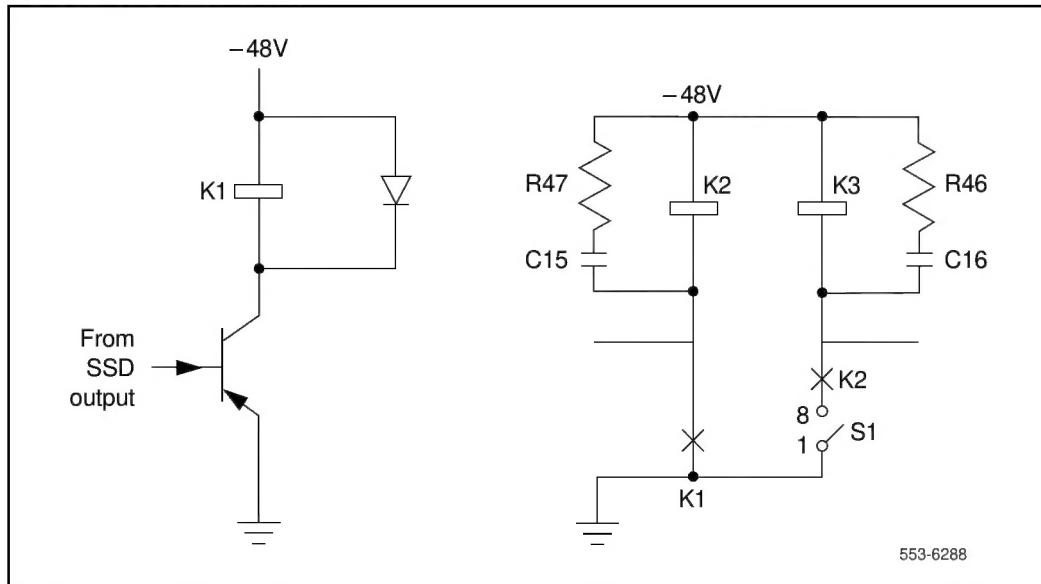


Figure 89
Talking connection

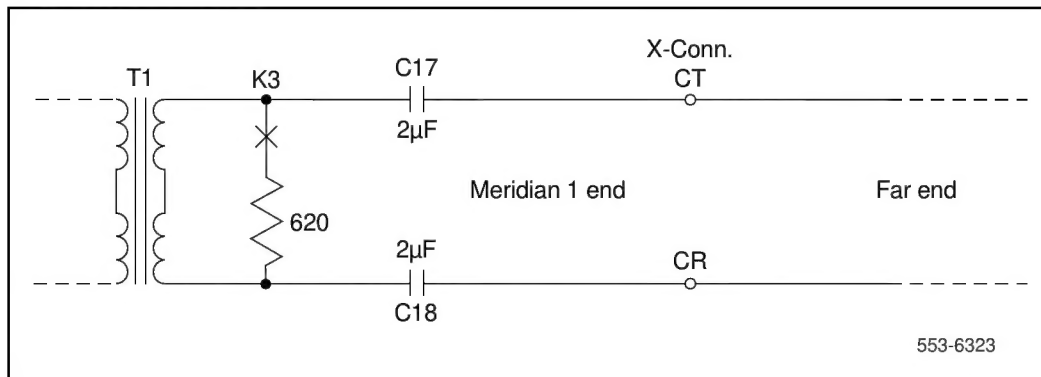
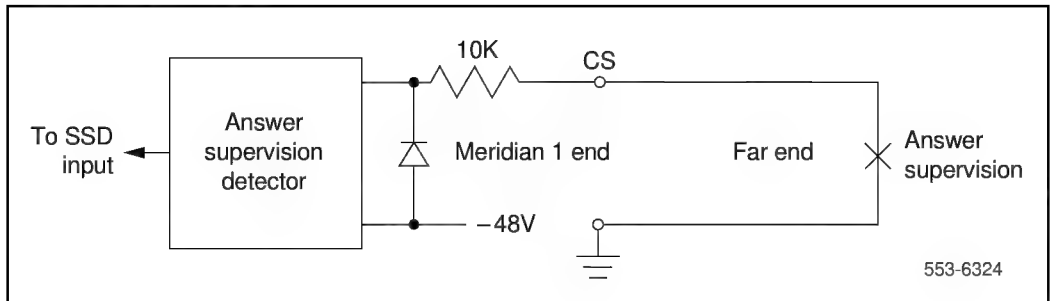


Figure 90
Answer supervision



Disconnection

The near end controls the trunk release by a message to the signaling logic to release K1. However, the trunk is not idled until the OS lead is grounded.

The hybrid codec encodes the analog input to produce a digital signal at DI that is applied through R11 or R13 and Q1 to the common multiplexing circuit.

Q2, controlled by messages to the signaling logic, is used to switch the gain of the digital-analog filter (DAF), to suit the connection loss requirement for various transmission paths.

Signals received from the common multiplexing circuit as DAT 0 into the hybrid codec are decoded in conjunction with signals SYN2 and LEN to produce the codec analog output.

The analog signal from the codec is connected to the input of low pass filter hybrids DAF. This circuit integrates the amplitude modulated pulses from the codec, filters the result, and amplifies the analog signal for connection through R40 and C14 to transformer T1.

Clamping diodes CR7, CR8, CR12, and CR13 protect the ADF and DAF from overvoltages. Resistors R26, R40, and the internal input termination of the ADF hybrid provide the proper termination for transformer T1 to prevent transmission of analog signals from the output of hybrid ADF to the input of hybrid DAF. Q3, controlled by messages to the signaling logic, is used to switch the gain of DAF to suit the connection loss requirement.

C17 and C18 are used to provide an AC-only connection to the recording machine through CT and CR leads ([Figure 89](#)).

Electrical specifications

This section lists the electrical specifications for the recorded telephone dictation trunk card.

Trunk interface electrical characteristics

Table 54 shows the electrical characteristics of the recorded telephone dictation trunk interface unit.

Table 54
Trunk interface electrical characteristics

Characteristic	Specification
Circuits per card	2
Nominal impedance	600 Ω balanced
Gain control pad	4 dB
Options	Dial tone during transmission
	No dial tone during transmission

Overload level

Signal levels exceeding +3 dBm applied to the tip and ring will cause distortion in the trunk.

Power requirements

[Table 55](#) lists the typical power requirements for the recorded telephone dictation trunk card.

Table 55
Power requirements

Voltage	Tolerance	Current (typical)
+10 V dc	± 5%	42 mA
−10 V dc	± 5%	42 mA
+6 V dc	± 1%	17 mA
−6 V dc	± 1%	17 mA
−48 V dc	± 12%	10 mA

Foreign and surge voltage protections

When telephone lines connected to the card are exposed to foreign voltages by direct contact or induction (such as power line crosses or lightning), protection devices must be installed on the customer's premises. These devices must be capable of providing a path to ground from tip and ring for foreign voltages that exceed 600 V peak.

Environmental specifications

[Table 56](#) lists the environmental specifications for the recorded telephone dictation trunk card.

Table 56
Environmental specifications

Parameter	Specifications
Operating temperature	0° to +60° C (+32 to +140° F), ambient
Operating humidity	5 to 95% RH (noncondensing)
Storage temperature	−40° to +70° C (−40° to +158° F)

Connector pin assignments

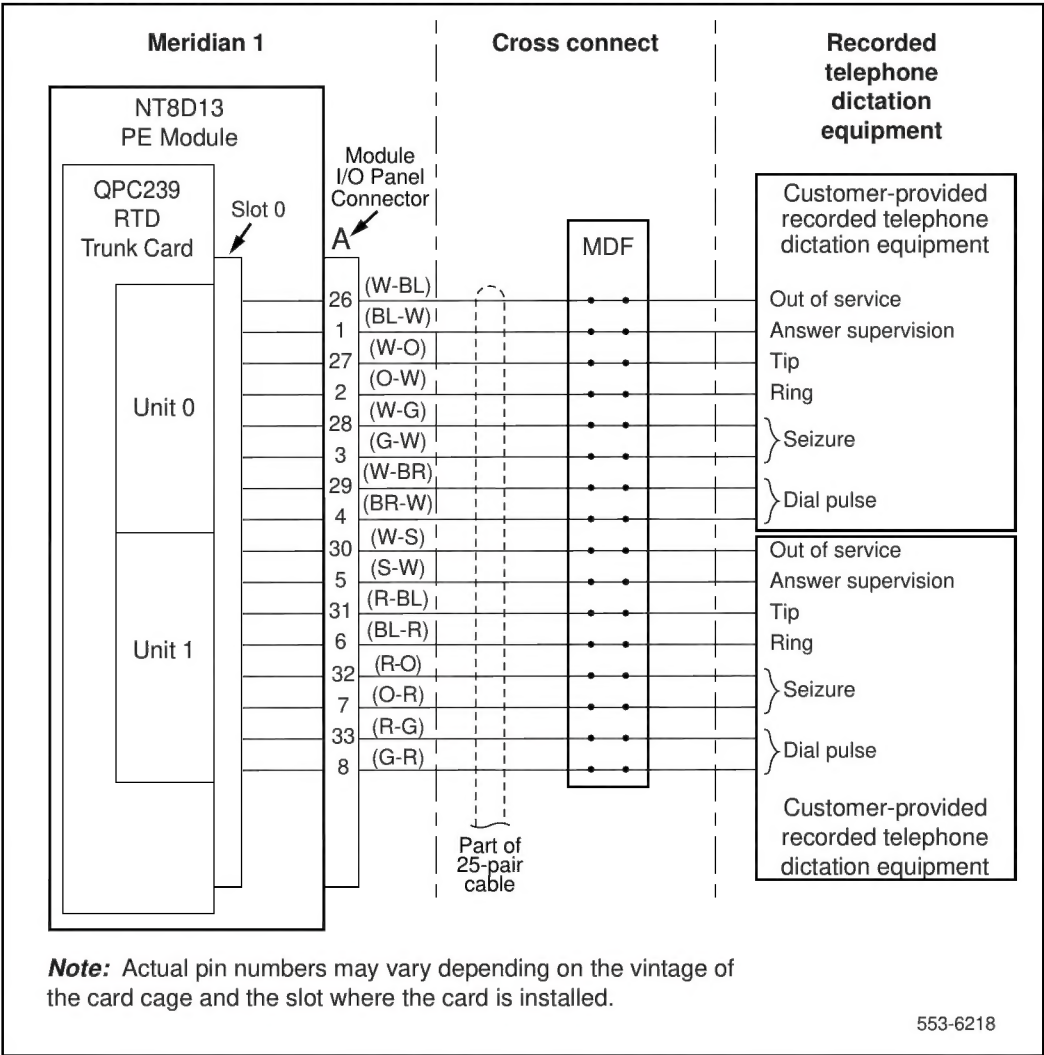
The recorded telephone dictation trunk card brings the analog trunks to the PE backplane through an 80-pin connector shroud. The backplane is cabled to the input/output (I/O) panel on the rear of the module, which is then connected to the main distribution frame (MDF) by 25-pair cables.

User-provided telephone dictation equipment connects to the trunk card at the MDF using a wiring plan similar to that used for line cards. A typical connection example is shown in [Figure 91](#), and a list of the connections to the recorded telephone dictation trunk card is shown in [Table 57](#). See *Meridian 1 system installation procedures* (553-3001-210) for complete I/O panel connector information and wire assignments for each tip/ring pair.

Table 57
Recorded telephone dictation trunk card—connections

Connector Pin	Signal Name	Function	Unit
36A	OS	Out of Service	0
37A	CS	Answer Supervision	
38A	T	Tip	
39A	R	Ring	
29A	CS1	Seizure	
30A	CS2	Seizure	
31A	CDP1	Dial Pulses	
32A	CDP2	Dial Pulses	
2A	OS	Out of Service	1
3A	CS	Answer Supervision	
4A	T	Tip	
5A	R	Ring	
9A	CS1	Seizure	
10A	CS2	Seizure	
11A	CDP1	Dial Pulses	
12A	CDP2	Dial Pulses	

Figure 91
Recorded telephone dictation trunk card—typical interconnections



Configuration

The trunk is enabled and the insertion loss is set by making software service change entries at the system terminal. The option to have transmission during dialing is enabled for each port by setting a switch on the recorded telephone dictation trunk card. The location of the configuration switches is shown in [Figure 92](#).

Switch settings

The option to have transmission during dialing is enabled for each port by setting a switch on the recorded telephone dictation trunk card. [Table 58](#) shows the settings for these switches.

Table 58
Recorded telephone dictation trunk card—switch settings

Transmission during dialing	Unit 0 Switch D33				Unit 1 Switch D8			
	1	2	3	4	1	2	3	4
Yes	off	off	off	off	off	off	off	off
No	on	off	off	off	on	off	off	off

Service change entries

The trunk type, features, signaling arrangement, and insertion loss for each trunk are set by making software service change entries in the Trunk Administration program (LD 14). Refer to the *Meridian 1 X11 input/output guide* for LD 14 service change instructions.

Figure 92
Recorded telephone dictation trunk card—switch locations

